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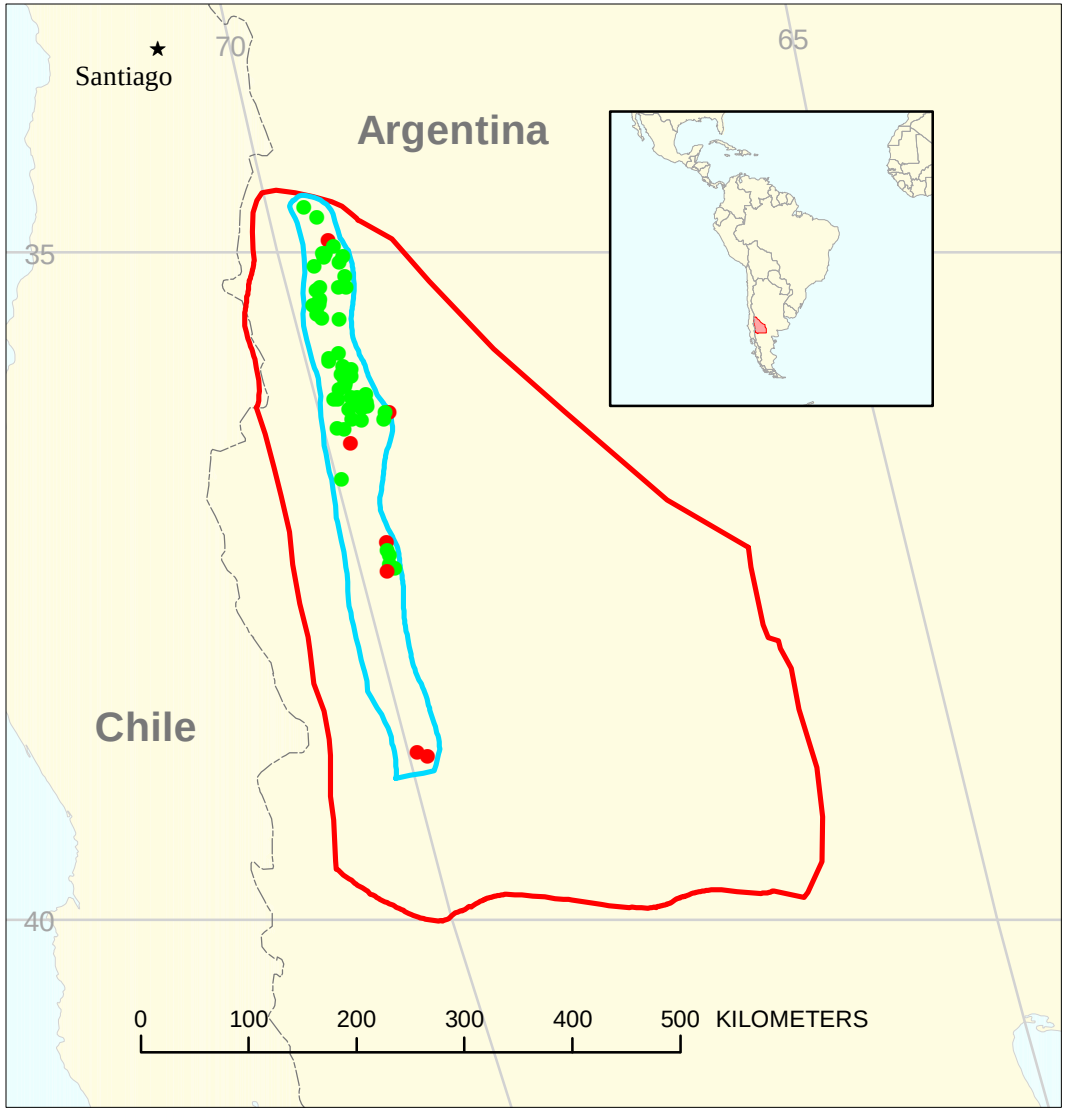
Neuquen Foothills Structure Assessment Unit 60550102



Neuquen Foothills Structure Assessment Unit 60550102
Neuquen Basin Geologic Province 6055

Geologic Summary

Detailed map of this assessment unit

Exploration/Discovery-History Data
- Plots of Known Field Sizes
- Plots of Grown Resources
- Tables

Assessment Input Data

Assessment Results
- Assessment Unit Summary
- Detailed Assessment Results
- Undiscovered Field-Size Distributions

USGS PROVINCE: Neuquen Basin (6055) **GEOLOGIST:** C.J. Schenk

TOTAL PETROLEUM SYSTEM: Neuquen Hybrid (605501)

ASSESSMENT UNIT: Neuquen Foothills Structure (60550102)

DESCRIPTION: This assessment unit is defined by structural traps of the fold and thrust belt along the western margin of the Neuquen Basin, an area commonly referred to as the South Mendoza Fold Belt and the Agrio Fold Belt. Mixing of oils from three source rocks led to the definition of a composite petroleum system.

SOURCE ROCKS: Source rocks include mudstones of the Lower Jurassic Los Molles Formation, Upper Jurassic-Lower Cretaceous Vaca Muerta Formation, and Lower Cretaceous Agrio Formation.

MATURATION: Maturation of the source rocks occurred in the Cretaceous and Early Tertiary. Some hydrocarbons were remobilized during Tertiary Andean compression.

MIGRATION: Hydrocarbons that were originally trapped in the Cretaceous and Early Tertiary were partly remobilized during the Andean tectonic event into anticlinal structures.

RESERVOIR ROCKS: Major reservoirs include Neuquen Group sandstones, Malarque Group sandstones and Agrio Formation sandstones; minor reservoirs include Auguilo Formation carbonates and Challaco Formation sandstones.

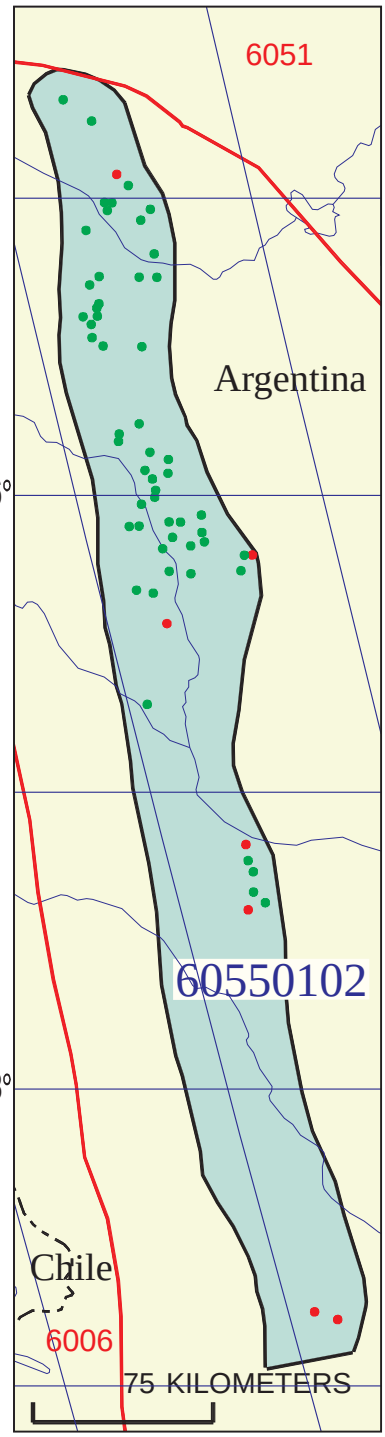
TRAPS AND SEALS: Traps are mainly anticlines, folds, and faulted anticlines formed during the compressional Andean tectonic event that began in the Early Tertiary. Seals are mainly local and intraformational mudstones.

REFERENCES:

Petroconsultants, 1993, Neuquen Basin–Basin Monitor: Geneva, Switzerland, Petroconsultants International, chapter paginated.

Urien, C.M., and Zambrano, J.J., 1994, Petroleum systems in the Neuquen Basin, Argentina, *in* Magoon, L.B., and Dow, W.G., eds., The petroleum system–from source to trap: American Association of Petroleum Geologists Memoir 60, p. 513-535.

Vergani, G.D., Tankard, A.J., Belotti, H.J., and Welsink, H.J., 1995, Tectonic evolution and paleogeography of the Neuquen Basin, Argentina, *in* Tankard, A.J., Suarez, R., and Welsink, H.J., eds., Petroleum basins of South America: American Association of Petroleum Geologists Memoir 62, p. 383-402.



Neuquen Foothills Structure Assessment Unit - 60550102

EXPLANATION

- Hydrography
- Shoreline
- 6055 Geologic province code and boundary
- Country boundary
- Gas field centerpoint
- Oil field centerpoint
- 60550102 Assessment unit code and boundary

Projection: Robinson. Central meridian: 0

SEVENTH APPROXIMATION
NEW MILLENNIUM WORLD PETROLEUM ASSESSMENT
DATA FORM FOR CONVENTIONAL ASSESSMENT UNITS

Date:……..	2/3/99		
Assessment Geologist:……..	C.J. Schenk		
Region:……..	Central and South America	Number:	6
Province:……..	Neuquen Basin	Number:	6055
Priority or Boutique…….	Priority		
Total Petroleum System:……	Neuquen Hybrid	Number:	605501
Assessment Unit:……..	Neuquen Foothills Structure	Number:	60550102
* Notes from Assessor	Lower 48 growth factor.		

CHARACTERISTICS OF ASSESSMENT UNIT

Oil (<20,000 cfg/bo overall) **or** Gas (≥20,000 cfg/bo overall):… Oil

What is the minimum field size?……. 1 mmboe grown (≥1mmboe)
(the smallest field that has potential to be added to reserves in the next 30 years)

Number of discovered fields exceeding minimum size:…… Oil: 35 Gas: 5
Established (>13 fields) X Frontier (1-13 fields) _____ Hypothetical (no fields) _____

Median size (grown) of discovered oil fields (mmboe):
1st 3rd 8.6 2nd 3rd 1.6 3rd 3rd 2.1
Median size (grown) of discovered gas fields (bcfg):
1st 3rd 13.4 2nd 3rd 169 3rd 3rd _____

Assessment-Unit Probabilities:

Attribute	Probability of occurrence (0-1.0)
1. **CHARGE:** Adequate petroleum charge for an undiscovered field ≥ minimum size……	1.0
2. **ROCKS:** Adequate reservoirs, traps, and seals for an undiscovered field ≥ minimum size……	1.0
3. **TIMING OF GEOLOGIC EVENTS:** Favorable timing for an undiscovered field ≥ minimum size	1.0

Assessment-Unit GEOLOGIC Probability (Product of 1, 2, and 3):……..…….....…. 1.0

4. **ACCESSIBILITY:** Adequate location to allow exploration for an undiscovered field ≥ minimum size……..……..…….. 1.0

UNDISCOVERED FIELDS

Number of Undiscovered Fields: How many undiscovered fields exist that are ≥ minimum size?:
(uncertainty of fixed but unknown values)

Oil fields:…….min. no. (>0)	6	median no.	40	max no.	90
Gas fields:…….min. no. (>0)	4	median no.	35	max no.	80

Size of Undiscovered Fields: What are the anticipated sizes (**grown**) of the above fields?:
(variations in the sizes of undiscovered fields)

Oil in oil fields (mmbo)…….……	min. size	1	median size	3	max. size	300
Gas in gas fields (bcfg):……..	min. size	6	median size	30	max. size	2400

Assessment Unit (name, no.)
Neuquen Foothills Structure, 60550102

AVERAGE RATIOS FOR UNDISCOVERED FIELDS, TO ASSESS COPRODUCTS

(uncertainty of fixed but unknown values)

Oil Fields:	minimum	median	maximum
Gas/oil ratio (cfg/bo)……	1500	3000	4500
NGL/gas ratio (bngl/mmcfg)……	10	20	30

Gas fields:	minimum	median	maximum
Liquids/gas ratio (bngl/mmcfg)……	5	15	25
Oil/gas ratio (bo/mmcfg)……			

SELECTED ANCILLARY DATA FOR UNDISCOVERED FIELDS

(variations in the properties of undiscovered fields)

Oil Fields:	minimum	median	maximum
API gravity (degrees)……	15	30	45
Sulfur content of oil (%)……			
Drilling Depth (m) ……	500	2000	4000
Depth (m) of water (if applicable)……			

Gas Fields:	minimum	median	maximum
Inert gas content (%)……			
CO_2 content (%)……			
Hydrogen-sulfide content(%)……			
Drilling Depth (m)……	500	2500	5000
Depth (m) of water (if applicable)……			

Assessment Unit (name, no.)
Neuquen Foothills Structure, 60550102

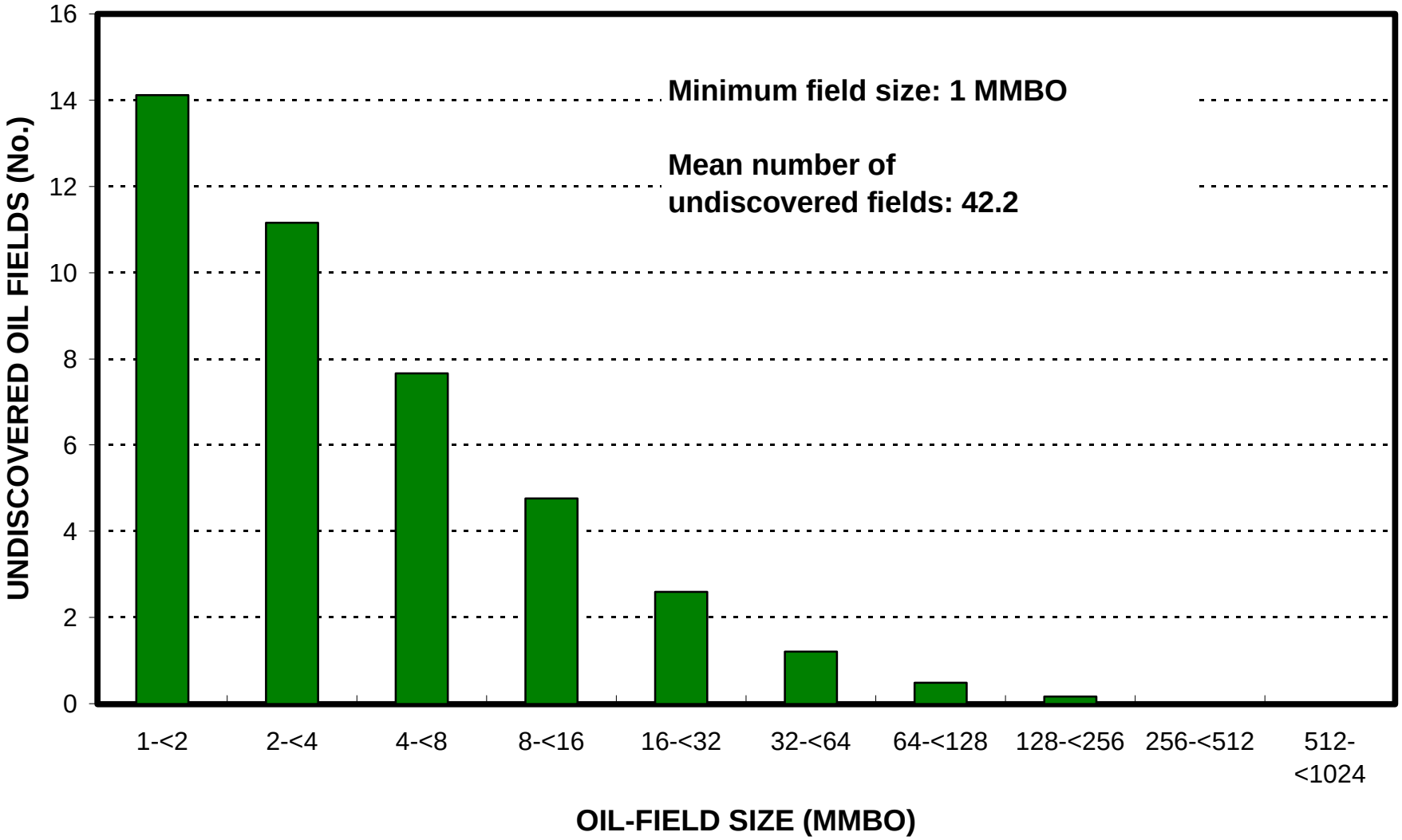
ALLOCATION OF UNDISCOVERED RESOURCES IN THE ASSESSMENT UNIT TO COUNTRIES OR OTHER LAND PARCELS (uncertainty of fixed but unknown values)

1. Argentina represents 100 areal % of the total assessment unit

Oil in Oil Fields:	minimum	median	maximum
Richness factor (unitless multiplier):……			
Volume % in parcel (areal % x richness factor):…		100	
Portion of volume % that is offshore (0-100%)……		0	

Gas in Gas Fields:	minimum	median	maximum
Richness factor (unitless multiplier):……			
Volume % in parcel (areal % x richness factor):…		100	
Portion of volume % that is offshore (0-100%)……		0	

Neuquen Foothills Structure, AU 60550102
Undiscovered Field-Size Distribution



Neuquen Foothills Structure, AU 60550102
Undiscovered Field-Size Distribution